Crime Mapping News

A Quarterly Newsletter for GIS, Crime Mapping, and Policing

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The topic of this issue of *Crime Mapping News* is international crime analysis and crime mapping efforts. For this issue, we have solicited articles from individuals engaged in crime analysis and crime mapping efforts around the globe. The articles in this issue cover topics including 1) a discussion of the considerations that may be faced by developing nations in their efforts to implement computerized crime mapping; 2) a discussion of three cases in South Africa where cellular telephone use was mapped to aid criminal apprehension and prosecution efforts; and 3) a study which used GIS to examine corporate deviance and passenger ship accidents in South East Asia and Northern Europe. We have also included Web site reviews of the New Zealand Police Force and the New South Wales Police Service.

International Crime Mapping: Caveats and Considerations

by Jim Griffin
Crime Mapping Laboratory, Police Foundation

Mapping criminal incidents and other types of police data through Geographic Information Systems (GIS) programs has proven to be an effective tool in analyzing and preventing crime and allocating law enforcement resources more efficiently. Police departments and private industry in Western countries have collaborated to refine and improve the practice of crime mapping to the benefit of their communities. But are such systems a luxury only developed nations enjoy? This article will address the future of crime mapping by exploring the feasibility of its implementation in the police departments of the developing world.

In the United States and several other nations, the use of GIS by law enforcement to map crime has surged. Preliminary results from a Police Foundation survey of American police departments show that almost 70% of large departments (100+ sworn personnel), and 40% of small departments (between 50-99 sworn personnel) are currently engaged in some form of crime mapping (Weisburd, Greenspan, and Mastrofski, 1998). In the United Kingdom, 44% of police forces have a crime mapping facility (Ratcliffe, 1999). Canada, Australia, and other nations have established beachheads in the field as well. The firm footing of crime mapping systems in these and other police departments can be attributed to many factors, namely the drastic reduction in equipment prices, the increased capacity of information systems, color printers, and a greater computer literacy among law enforcement professionals. Western law enforcement has also benefited from the automation of law enforcement data, the development of crime analysis as a discipline, and the involvement of GIS companies in the field of law enforcement. Generally, the discipline of crime mapping is quite sophisticated in developed countries.

Note from the Editors: *The opinions expressed in the articles of this newsletter are those of the authors and do not necessarily reflect the views of the Police Foundation or the COPS office. In addition, only light editing has been made to the articles in order to keep each author's voice and tone.*

Inside this Issue

The Crime Mapping Laboratory has a new logo! See page 6 for details.

This sophistication is reflected in the assumptions from which the study of the field proceeds. One is that a bolstered law enforcement presence will reduce crime. Put officers where the crimes have been committed and criminal activity will drop off. Also, terminology among police officers is universal. Since English is the primary language for these countries and their technology, police can easily liaise with their colleagues across borders. Moreover, there is the understanding that funding for new technological initiatives might be difficult but not impossible. Shake the money tree hard enough and something will fall. Finally, law enforcement agencies assume a basic computer literacy among its police officers and staff. If an officer does not have this minimum proficiency, there are options available to receive training. Police departments in developed countries generally are equipped with the resources and personnel to take proactive efforts in specialized fields like crime mapping and have access to relatively accurate crime data.

While this may be the case in the police departments of Bristol, Canberra, or Dallas, the situation is quite different in Bombay, Caracas, and Dushanbe. In the developing world, not only is there a paucity of computerized crime mapping, but the mere notion of a police force actually using it would strike most as the product of fantasy. Police departments are subject to the same limitations as other areas of their respective societies. As with anything else, money is crucial. A lack of it will exact a heavy toll on law enforcement efforts to combat crime while emboldening criminal elements to violate the law with impunity. According to the Rand Corporation, "about 95 percent of a typical law enforcement agency's budget is dedicated to personnel" (Schwabe, 1999). With the paltry budgets some overseas police departments command, it is hardly surprising that little, if any, remains for investment in crime analysis and prevention tools like crime mapping.

"In the developing world, not only is there a paucity of computerized crime mapping, but the mere notion of a police force actually using it would strike most as the product of fantasy."

Although money remains perhaps the most formidable obstacle to establishing and maintaining a crime mapping system overseas, other hurdles exist and indeed they are many and daunting. For example, there is the standard of technological experience. Computers and other electronic tools taken for granted in the Western world could be entirely absent not only in households, but in police departments as well. As a result, law enforcement may be hard pressed to find a computer-savvy member in its ranks.

Other hindrances to the implementation of a GIS system are the lack of police data and inaccurate, outdated, or simply no maps. For example, in Karachi, Pakistan (a city of 14 million and growing), there are no updated, comprehensive maps of the city, let alone one rendered into GIS format. Police jurisdictions are ambiguous due to an incomplete system of addressing and the presence of numerous illegally constructed settlements that do not appear on official maps. In large, relatively unplanned cities like Karachi, these concerns must be examined before commencing a discussion on crime mapping. Fortunately in this case, the United Nations Development Program has rendered assistance (Pryjomko, http://www.gis.com/speciality/government/karachi.html). Undoubtedly, more cities could benefit from similar initiatives.

As in other sectors, the language barrier can hobble law enforcement efforts in regard to GIS. Software in English, Spanish, and French abounds. Is such software, assuming it can be procured, of use to a police department literate in Mongol, Kyrgyz, or Albanian? Some countries have multiple languages and dialects, further complicating police efforts. According to one report, in South Africa (a nation with eleven official languages), "some of the police officers are functionally illiterate" (Schmitz, Cooper, and Potgieter). Purchasing translation supplements or training an in-house interpreter could stretch lean budgets thinner still.

These considerations will have little relevance to police officers working in countries where the infrastructure is ill-equipped to support even basic human needs. According to Karuppannan Jaishankar, a doctoral research fellow in the Criminology department at the University of Madras in India: "GIS crime mapping is in a rudimentary stage. The problem is the lack of infrastructure facilities for the police in India." Sparse electricity service or other basic utility issues would preclude supporting an electronic crime mapping system (or much of anything else for that matter). In such a city, it is reasonable to infer that a crime mapping system would not even register on the radar screen of budget priorities.

There are more universal difficulties as well; namely, the human aversion to change. Present routines are familiar, and learning new skills takes time that could be spent on other tasks. Throw in some of the aforementioned complications, and the new technology becomes decidedly less attractive. Therefore, a successful implementation would involve as seamless an incorporation of the new system into the daily routine as possible.

Of course, there are countless other issues that must be considered before embarking on a GIS-based mapping program. Many are culturally based, and therefore difficult to anticipate. Yet there should be a certain degree of awareness in order to prevent any cross-cultural gaffe. As a former Peace Corps volunteer, I have seen numerous occasions where a well-funded, well-intended program has fallen flat on its face in far-flung corners of the world (much to the chagrin of the parties on both sides of the cultural divide). So perhaps

Chevrolet should have been a bit more diligent in its research before forging ahead with its plans to sell its Nova (translated "no go" in Spanish) models in Latin America. Maybe Nike should have done its homework marketing its swoosh logo in Arab-speaking nations (it is the Arabic word for God). And when trying to assist overseas colleagues in getting their GIS mapping programs up and running, perhaps it must be understood that the "one size fits all" approach might yield disappointing results.

So why concern ourselves with the matter? First, any police department, regardless of location or national origin, stands to benefit from crime mapping. This field forces police to critically examine their data. Even if a police force does not share the information with other agencies, an analytical approach to data will result in a more efficient use of police resources.

Also, we cannot afford to ignore crime beyond our borders. Transnational organized crime groups have expanded their operations and diversified their criminal portfolios both to the detriment of the developed and developing world alike. Moreover, the dramatic geopolitical shifts of the last 10 years, coupled with the growing trend of globalization, have hastened the expansion of transnational crime while diluting the importance of borders. NAFTA, the European Union, the implosion of the USSR, and other such monumental changes have facilitated free trade. Unfortunately, these changes have had the inadvertent effect of providing fertile ground in which organized crime groups thrive. The technological advances of the last ten years have also assisted criminals in a variety of capacities (e.g., cyber crime, bank fraud, and child pornography). Most significantly, the Internet has further eroded the significance of national boundaries. Wired criminals can easily commit their mischief well beyond the reach of law enforcement's jurisdiction. Although technology has become a problem, it may also serve as a remedy. Of course, crime mapping is part of the solution.

The challenge is formidable, but police departments worldwide have accepted it with relish. In La Plata, Argentina, six officers have received GIS training (three of whom are proficient in ArcView and CrimeStat). With World Bank backing, as well as funds from the provincial government, maps have been updated and coded in GIS. South Africa's Police Services continue to make strides in implementing crime mapping at the strategic and tactical levels. The GIS capabilities of Mexican police have impressed their colleagues north of the border and beyond. In Chennai, India, the push toward establishing a crime mapping system with upgraded maps and consolidated crime data appears to be gaining steam. A legitimate crime mapping department should be operational in one year.

These examples will undoubtedly multiply as the globe shrinks and the demand for more efficient policing grows. Despite the substantial barriers to the procurement and sustainability of crime mapping systems overseas, the desire for safe, secure neighborhoods will provide a powerful impetus to overcome these obstacles. Expanding the field of crime mapping will result in a greater exchange of information and increased trans-border cooperation between law enforcement professionals. A greater market for GIS and law enforcement software could accelerate competition among technology companies, thus reducing prices for computers and equipment. Acting in concert, these factors would contribute to safer and more peaceful cities across the globe.

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Mapping Crime Scenes and Cellular Telephone Usage in South Africa

by Antony K. Cooper and Peter M.U. Schmitz
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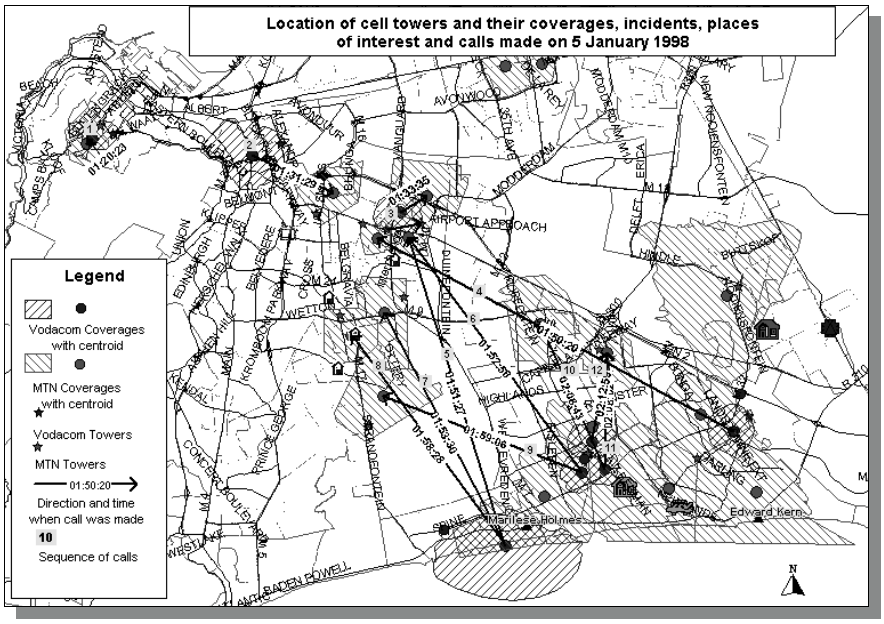
Introduction

This article describes a method that uses a desktop Geographical Information System (GIS) to plot cellular telephone conversations made when crimes are committed, such as hijackings, hostage taking, kidnapping, rape, and murder. The maps produced in this manner are used in court to help the court understand the sequence of events when the evidence is presented, which can be very difficult to understand without such visual aids. The maps can also be used as part of the prosecution's evidence against the accused. The billing records of the relevant telephones are obtained through a search warrant and for each call made before, during, and after the commissioning of crimes, the approximate locations of the two telephones are plotted on a map.



Map 1. Calls made after a hijacking incident

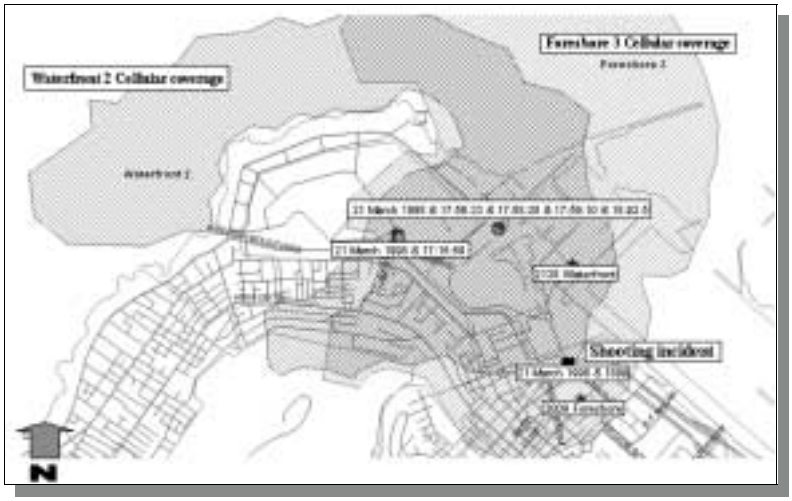
The Three Court Cases

We have used this technique in three court cases in South Africa—to the best of our knowledge, the first time computer-generated maps have been used in a criminal case in South Africa. Two of the cases resulted in successful convictions, while the third case is still before the court. The first case involved the hijacking of a motor vehicle, hostage taking, and the subsequent rape and murder of the victims (see Map 1).

The second case involved the shooting of four victims by an individual. Map 2 shows the Cape Town Waterfront area overlain with the coverage areas of the two cellular telephone transmitters used during the incidents (the two hatched areas), the calls made, and key locations. In both cases, the maps were crucial for obtaining the conviction and sentencing of the accused. The third case involves the kidnapping of a businessman for ransom. Map 3 gives an overview of the calls leading up to the kidnapping. The hatched lines represent the different coverage areas for various cellular telephone transmitters. The two completed cases occurred in Cape Town and the third in Durban; and in all three, cellular telephones were used before, during, and after the commission of crimes.

Data Used

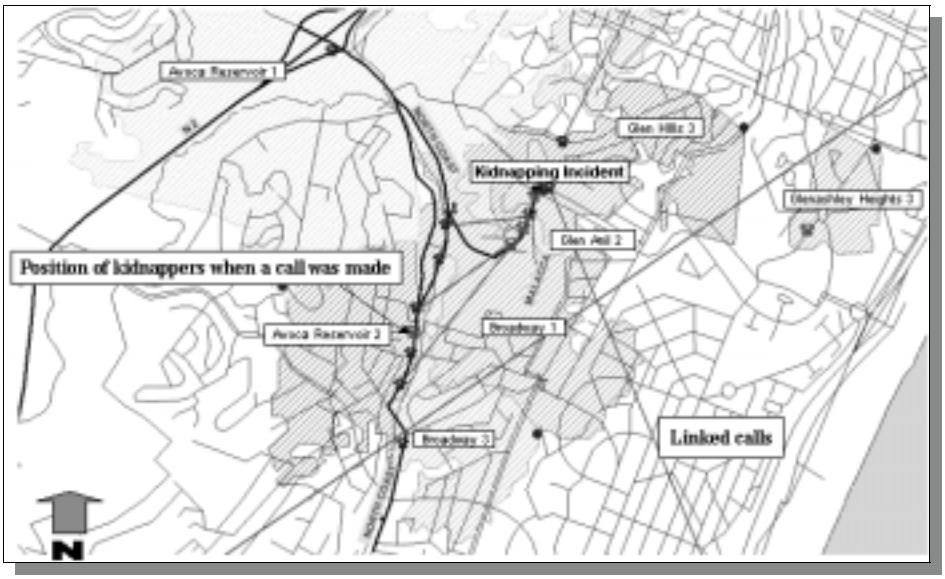
In all three cases, the South African Police Service (SAPS) used search warrants to obtain billing records for the relevant cellular telephones, as well as the locations of the cellular telephone base stations (transmitters) used and their areas of coverage. Using digital street maps of Cape Town and Durban and the areas of South Africa from MapStudio as the background, we mapped the locations of the telephones when the calls were made, together with the locations of the transmitters, their areas of coverage, from Vodacom and



Map 2. The waterfront shooting incident

MTN (cellular service providers), and other places of relevance for the cases. For the two cases in Cape Town, we approximated the locations of each cellular telephone by using the centroid (centre of gravity) of the area of the coverage of the relevant transmitter the telephone was using during the call.

For the Durban kidnapping case, based on his knowledge of the events and the area, the investigating detective indicated the approximate position we should plot for the telephone when each call was made or received (see Map 3). For example, the service provider identified the possible location from where the last call originated. The police used information provided by the service provider to identify the house where the victim was being held and were able to free him and arrest the accused.



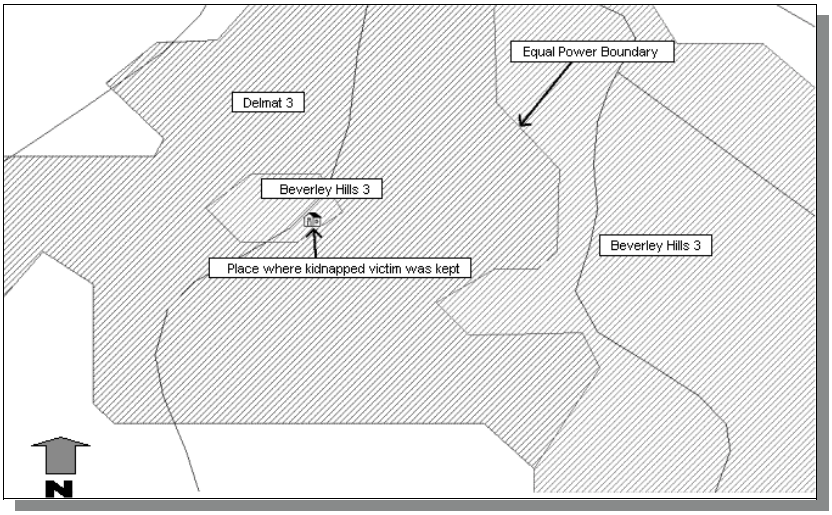
Map 3. The build-up to the kidnapping incident in Durban

Coverage Boundaries

Two different boundaries for cellular base station coverage were used. In the two Cape Town cases, the 95% probability boundaries (see Map 4), and in the Durban case, the equal power boundaries have been used (see Map 5). The 95% probability boundaries are produced by the planning tool used by the cellular service provider and show the boundary in which the probability that a cellular telephone will be in contact with a specific tower is higher than 95%. Map 4 gives examples of the boundaries of the 95% signal strength areas for two of the three segments for a cellular telephone transmitter.

The equal power boundaries are also generated by a planning tool called Planet (Vodacom's planning tool for locating base stations optimally). The boundary is where the signal strength is equal between two cells. The equal power boundaries proved to be very useful in the Durban kidnapping case, since they showed small pockets of coverage in another cell from the cell in question. These pockets are due to the topography of the KwaZulu Natal coastal belt, which is very hilly. Map 5 shows the coverage areas of two adjacent cellular telephone transmitters (the hatched areas). The boundaries between them are where they have equal transmitting power. Of significance is the island within "Delmat 3," that because of the local topography, receives its coverage from "Beverley Hills 3." The victim was kept hostage at a house in this island. We recommend that equal power boundaries be used in the future since these boundaries can be provided easily in digital form by the service providers.

Map 4. 95% signal strength boundary



Map 5. Equal power boundaries of cellular coverage and the location where the kidnapped victim was kept

Conclusion

For each call in all three cases, we showed the approximate location of each telephone during the call and connected it with a line annotated with the time the call was made, its duration, and a sequence number for the call, based on the detailed billing records provided by the two different cellular service providers. This enabled the prosecutor to lead the court through the sequence of events, with the map providing a graphic, easy to understand picture of the case. It also enabled the prosecutor to show where the person using the telephone was at the time of the call, which could be used to break an alibi.

We believe that the GIS provide a powerful, easy to use tool that can make a big impact on a court case. Indeed, we have been led to believe that in one of these cases, charges would have been dropped without the map.

Note: This project was funded partially by the Innovation Fund of the South African Department of Arts, Culture, Science and Technology.

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Announcing…

The Crime Mapping Laboratory's new logo!

Look for our logo on all future Crime Mapping Laboratory products and publications!

Solicitation for Examples of Crime Analysis Reports, Bulletins, and Maps!

The Crime Mapping Laboratory is seeking examples of crime analysis products, case studies, and problem-solving projects from law enforcement agencies around the world. Crime analysis products may range from a simple one-page crime bulletin to a more detailed report that includes various maps, tables, and statistics. Case studies refer to specific problem-solving efforts; that is, what problem was analyzed, how the information was used, and what was the outcome.

Possible examples include:

- Crime trend bulletins
- Monthly reports and maps
- Annual reports
- Special reports, e.g. studies of schools, traffic accidents, or bars
- Any other innovative products you have developed that will benefit others!

We would like to compile these examples of crime analysis/problem-solving products from the field, analyze them by looking for commonalities, accuracy, and relevance, and then solicit feedback from law enforcement professionals and other experts in the field. With this knowledge, the Crime Mapping Laboratory will develop product templates that can be used and/or adapted by any police department, and we will make these templates available to the law enforcement community. In addition, we will publish selected examples and case studies in the *Crime Mapping News*. This is a great opportunity to assist others and gain recognition for your contributions to the disciplines of crime analysis and crime mapping.

Please submit crime analysis/problem-solving products and full contact information (including name, title, organization, mailing address, telephone, and e-mail) by March 16, 2001 to the address below:

Police Foundation
Crime Mapping Laboratory
1201 Connecticut Ave. N.W.
Suite 200
Washington, DC 20036

If the reports you are submitting include any sensitive information such as names or case numbers, feel free to exclude this information or replace it with sample data as we are more concerned with the format than with the content of the reports. We are gathering this information for research purposes only, and the report(s) you send us will not be reproduced or distributed without prior approval. If you have any questions, feel free to contact the Crime Mapping Laboratory; contact information is provided on page 11.

We encourage you to take this opportunity to share your work with others and make a contribution to advancing the disciplines of crime analysis and mapping!

Using GIS to Examine Maritime Corporate Crime: A Study of Philippine Passenger Ship Accidents

by Gisela Bichler-Robertson, PhD, Assistant Professor
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Crime mapping is principally used by law enforcement to examine aggregate levels of serious crimes, particularly index offenses like robbery, assault, and homicide, and street-level crime like drug sales, gun violence, and gang behavior. To date, there has been minimal use of GIS technology to study aggregate levels of corporate deviance. The following is an abbreviated analysis extracted from a larger study of maritime commercial passenger ship casualties occurring between 1950 and 1998. It details corporate crime and negligence in the maritime passenger transport and cruise industries occurring in South East Asia. For a more detailed description of the study see Bichler-Robertson, 2000. (Please note, "casualty" refers to any loss or damage to the vessel, whether or not human injury or death occurs.)

Corporate Negligence as a Causal Factor in Passenger Ship Accidents

Accident investigators and researchers alike attribute most maritime casualties to human error. Formal inquiries repeatedly find that about 80 percent of the accidents investigated are the result of human error (Lloyd's List, 1994; Tasca, 1990; Millar, 1980: 9; Gardenier, 1981; Benkert 1978). Recently, evidence has begun to accumulate suggesting that the accident investigation process is somewhat biased and may be overlooking the true cause of the event (Tasca, 1990). Presumptions on behalf of accident investigators lead them to overlook, and even neglect, the role played by the larger organization (Tasca, 1990; Peterson, 1980).

> "To date, there has been minimal use of GIS technology to study aggregate levels of corporate deviance."

Following maritime accidents, investigators examine shipboard operations in great detail in order to reconstruct the event and identify the individual(s) directly responsible for the incident. Focusing exclusively on shipboard operations that immediately precede the event inevitably leads to the discovery of some level of operator error. Typically, the captain and crew are singled out as the responsible parties and human error is listed as the principal cause (Peterson, 1980).

Critics of the operator error explanation argue that investigators need to account for the context of the organization within which the master and crew maneuver (Tasca, 1990). Unrealistic sailing schedules, staffing deficiencies, and inadequate equipment maintenance are all executive profit-driven decisions that directly affect the operating conditions of the vessel. If the corporation chooses to maximize profit at the expense of safety, then it knowingly puts the lives of passengers and crew in danger and thus, its negligent actions render the corporation criminally culpable. From this perspective, accidents are caused by corporate negligence (Mueller and Adler, 1991; Tasca, 1990; Gray, 1978; Maritime Transportation Research Board, 1976).

For the purposes of this research, "corporation" is defined as an incorporated organization or collective that can function as a legal trading enterprise oriented toward making profits for an owner or set of shareholders. It is a legal entity whose directors and managers constitute its directing mind. Lower level employees, while employed by the organization, are not part of the corporation even though some of their actions may invoke certain vicarious liability (Pearce, 1995).

Indicators of Corporate Negligence

Corporate negligence within a maritime context involves acts of omission or commission resulting from deliberate decision-making by those occupying structural positions within the business organization—corporate executives or managers—that renders the vessel unseaworthy or unfit for its intended use. Establishing that profit-maximizing decisions were the true cause of an event is a very difficult enterprise because the most crucial evidence is under the direct control of the corporate executives.

A review of maritime research and trade literature reveals a number of factors thought to be indicative of corporate attempts to maximize profits at the expense of safety including, but not limited to: vessel age (over 20 years old), inadequate vessel maintenance and/or inoperable auxiliary equipment, loading beyond legal capacity, and failure to record the actual number of passengers and crew on board. The most prolific factor, linked to all previously mentioned characteristics is a class of registration known throughout the industry as flags of convenience (FOC). In the absence of direct access to corporate decision-making, these factors are indicative of corporate decisions to maximize profit that unduly affect the seaworthiness of the vessel.

To represent corporate negligence, indicators of each factor listed above were created and summed to create an index of negligence. One point was given for the presence of the condition. Events with more than three points on this index are associated with high levels of corporate negligence.

System Hazard

A second possible explanation for accidents is system hazard. Accidents occur within a system of transportation. This includes the management practices of other vessel owners, in addition to the various agencies, conditions, corporations, and governing bodies that coalesce around the commercial maritime passenger trade including but not limited to: classification societies, Protection & Indemnity Clubs, port authorities, registries, Coast Guard, weather, traffic volume, and treacherous channels. Inter-relationships between these system components generate hazards within which individual vessels operate (Perrow, 1984). System hazard was defined as a general overarching threat posed by external or systemic elements associated with an industry within a particular area/location. The threat is all encompassing since every actor within the area has an equal chance of being involved in an event.

Given the complexity of the system, duration of the study period, and global nature of this research, it was not possible to create direct measures of each system component. Six variables were combined in an additive fashion to create an index of system hazard: low enforcement capacity (GDP), high exposure to hazard (voyage length), the event occurred in a high traffic area (proximity to harbors and busy shipping lanes), the event involved a collision with another vessel (density of traffic and behavior of other vessels), and finally, inclement weather was a contributing factor (storms). Similar to the index discussed above, events with three or more points were associated with significant levels of hazard.

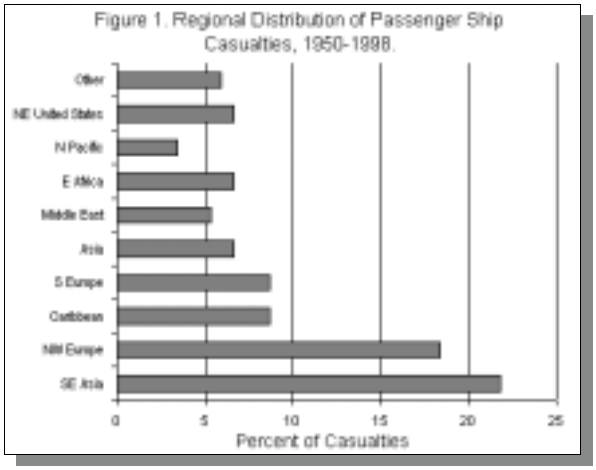
Collecting Data about Corporate Decision-Making

Data about passenger ship casualties are difficult to obtain. Many of the corporations operating these vessels are large multinational organizations that sail vessels in various remote locations. Often these vessels move between regions—for example, the vessel may sail Alaskan Cruises in the summer season, then move to the Caribbean for the winter—consequently, it is difficult to track vessels through public sources of information. Central depositories of casualty information do not exist. Flag nations have investigative jurisdiction over accidents and many are not forthcoming with information. Also, insurance agencies are headquartered in various nations and these reports are not easily obtainable by the public. This means that the information needed to investigate corporate misconduct is scattered around the world in diverse sources.

Collecting information for this study required piecing together bits of information from all available sources. Newspapers, wire services, and Lloyds List were scoured to find initial event information—name and ownership of the vessel, location of event, eyewitness testimony of the condition of the vessel at the time of the casualty, number of people involved, and estimates of the seriousness of the event in terms of lives lost and material damage to the vessel. Using vessel characteristics such as the name, owner, and accident location reported in news sources, it was possible to search Maritime Court proceedings and the reports of national accident investigation commissions to obtain detailed information about the vessel's management and the factors leading up to the event. Cross-referencing vessel name with the listings of registries provided accurate information about the vessel's legal capacity, major renovations, age, and other pertinent details.

Results

Of the 653 events identified through the data collection process outlined above, 532 were included in the study. In excess of 24,205 people died in these accidents (n = 512) and an additional 6,840 were seriously injured (n = 470). Most of the events involved collisions (28 percent), fires (25 percent), or grounding (19 percent). About 34 percent of the casualties were formally investigated: government agencies conducted about 71 percent of these inquiries, 19 percent were investigated by Coast Guards, and six percent of the investigations involved criminal trials.



Clearly evident in Figure 1 is a high concentration of events in South East Asia. While the spatial concentration in this region is not surprising given the high volume of shipping traffic, the nature of the events is unusual. Compared to the other major hotspot of events (Northern Europe), South East Asian casualties include five times as many loading-related events and twice the number of weather-related casualties. Furthermore, South East Asian vessels were twice as likely to be old, and 70 percent of the casualties involved vessels that set sail in conditions that would violate U.S. Coast Guard safety standards. Also, 60 percent of vessel owners were unable to account for all of the passengers following the event (see Table 1).

Table 1. Description of Indicators of Corporate Negligence for Commercial Passenger Ship Casualties occurring in High Volume Areas, 1950 – 1998.

	South East Asia Percent (valid cases)		Northern Europe Percent (valid cases)	
Old Boats (>20 years)	58.6	(70)	25.7	(74)
Safety Violations	70.1	(67)	41.4	(58)
Poor Manifest	60.4	(91)	11	(73)
Overloaded	27.9	(111)	1	(97)
Flag of Convenience	7	(115)	14.4	(97)

Note: The total number of events in South East Asia was 115 and there were 97 events in Northern Europe.

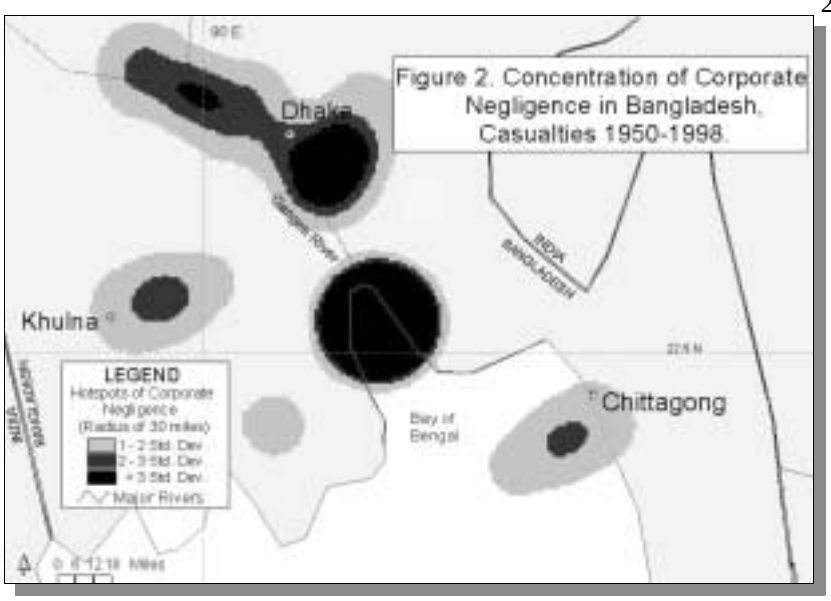
Table 2. Description of Event Seriousness within High Volume Areas, 1950 – 1998.

	SE Asia	N Europe
Seriousness		
Minor	12.6 %	52.6 %
Moderate	15.3 %	22.1 %
Serious	12.6 %	14.7 %
Catastrophe	59.5 %	10.5 %

Note: Information was available for 111 events in SE Asia and 95 events in Northern Europe

Despite the smaller average size of vessels sailing in South East Asia (3,163 versus an average of 11,985 gross tons), the losses are greater: on average, 69 percent of passengers survived the event compared to 93 percent of Northern European passengers; and 72 percent of the events were ranked above serious compared with 26 percent of Northern European casualties (see Table 2). A significant factor accounting for this difference is the nature of evacuations when events occur. Approximately 72 percent of casualties transpiring in South East Asia constituted crisis evacuations while only 16 percent of Northern European events faced similar conditions. A difference in economic resources and investment in maritime search and rescue may account for this dramatic variation in event magnitude.

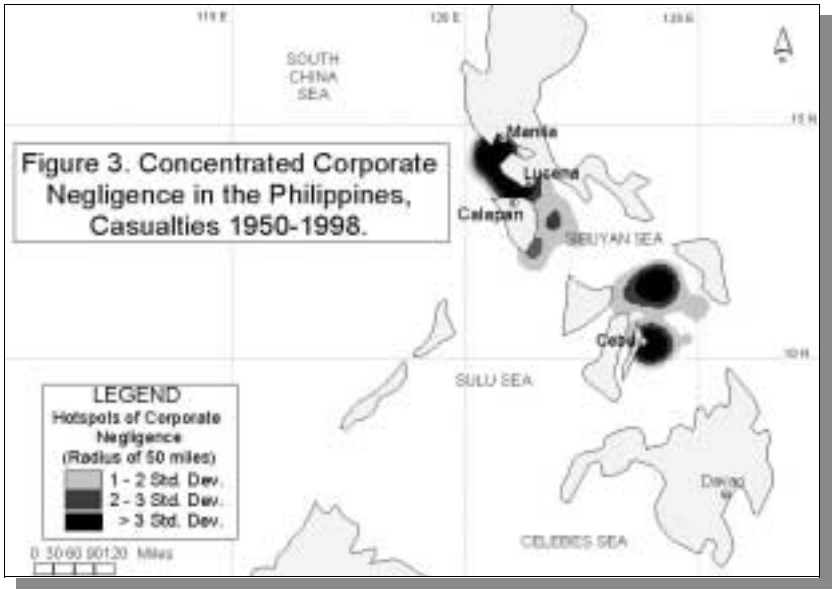
Examining the geographic distribution of corporate negligence and system hazard within South East Asia revealed an interesting pattern. In general, three major ports were associated with high levels of corporate negligence: Dhaka, Bangladesh and Manila. Figure 2 displays the concentration of events associated with high levels of corporate negligence within Bangladesh using the kernel smoothing technique with a radius of 30 miles. Two areas along the Ganges River show concentrations of negligence that are beyond three standard deviations from the average levels in this region. A third region involves a tributary commonly used for access to Dhaka.



In the Philippines, events that are highly associated with corporate negligence tend to concentrate along the route between Calapan and Manila. The areas near to Cebu City also show concentrations of negligence (kernel smoothing technique with a radius of 50 miles) that are beyond three standard deviations from the regional mean. These areas show significant overlap with high levels of system hazard suggesting an interaction effect (See Bichler-Robertson, 2000).

Corporate negligence becomes an important explanatory factor in maritime casualties where the ship pathways cross heavy volumes of traffic, near major ports. Negligently managed vessels become exceptionally problematic when they travel in close proximity to other vessels, a condition commonly found near major ports. Policy implications include: locating Port State inspection programs outside of the high risk area; increased Coast Guard presence within hotspots; and adjusting investigatory strategies following accidents to target corporate management in addition to shipboard operations.

Researchers specializing in the study of corporate crime provide extensive analysis of corporate wrong doing in the name of profit (Clinard, 1990; Punch, 1996; Keane, 1993; Mokhiber, 1988). Subverting laws through cost-cutting measures equates to rational risk-taking that may constitute criminal negligence. Traditional crime map-ping applications have been restricted to a set group of crime types. Geographic analysis can provide important information about the geographic properties of corporate crime.



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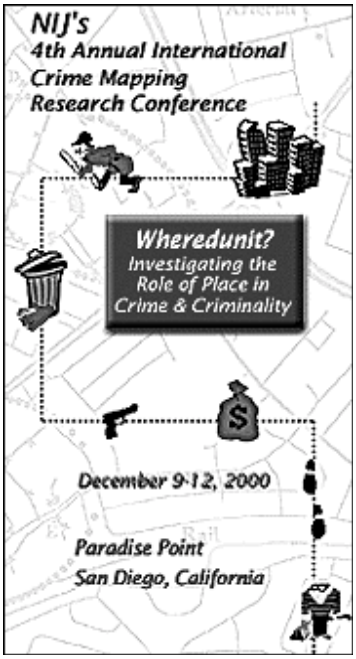
Conference Summary: Fourth Annual International Crime Mapping Research Conference December 9 – 12, 2000



The Fourth Annual International Crime Mapping Research Conference, *Wheredunit? Investigating the Role of Crime and Criminality*, was held in San Diego, California from December 9th through 12th, 2000. The conference was attended by approximately 550 individuals, representing a variety of agencies, including law enforcement agencies from the United States and abroad, as well as federal agencies, universities, non-profit organizations, and software companies. These individuals attended the conference with the goals of learning more about the disciplines of crime analysis and crime mapping, networking with professionals from around the globe, and meeting representatives from various software companies.

On Saturday, December 9th, several introductory pre-conference sessions were held. These sessions included hands-on workshops for both MapInfo and ArcView users, introductory GIS and mapping presentations, and discussions of specific topics such as data scrubbing, implementing GIS in a law enforcement agency, privacy and data confidentiality, and hotspot methods. The conference officially commenced on Sunday, December 10th with a welcome address by Elizabeth Groff, the Acting Director of the Crime Mapping Research Center, and Sally Hillsman, the Acting Deputy Director of the National Institute of Justice. Their welcoming address was followed by a discussion entitled *GIS and the Broken Windows Hypothesis*. The majority of the conference sessions held over the next two days were concurrent breakouts featuring presentations in four main categories: (1) analytical tools and techniques, (2) research, (3) case studies, and (4) advanced topics.

The presentations included in the analytical tools and techniques track focused on data sources and analysis techniques. The presentations included an introduction to federal data resources, Census 2000 data, international approaches to crime mapping, and crime analysis and crime mapping tools. Presentations included in the research track were dedicated to various research theories with relevance to crime mapping, including Routine Activities, Risk Focused Policing, and Environmental Criminology. Presentations in the case studies track included discussions of school safety, mapping for corrections, international mapping efforts, and multi-agency applications. Lastly, the advanced topics track included innovative mapping efforts in the areas of serial offender geography, predictive modeling, and advanced hotspot methods.

The Fourth Annual International Crime Mapping Research Conference was a success, and it provided valuable opportunities for practitioners, researchers, and corporate representatives to come together, learn more about the discipline of crime mapping, and share their expertise. This article provides only a brief listing of some of the presentations that were included in this year's conference. The CMRC has indicated that several presentations will be made available on their newly redesigned Web site. Please visit their site at www.ojp.usdoj.gov/cmrc for additional details.

As an early reminder, the Fifth Annual Crime Mapping Research Conference will be held at the Adams Mark Hotel in Dallas, Texas from December 1st through 4th, 2001. As they become available, details will be posted on the CMRC's Web site and in the Police Foundation Crime Mapping Laboratory's *Crime Mapping News*.

NEXT ISSUE

The topic of the next issue of the *Crime Mapping News* will be school safety. We plan to explore the utility of GIS for mapping crime and related law enforcement data in and around schools We look forward to your participation in submitting articles for the upcoming issue.

If you are interested in contributing to the next issue or any future issue, please contact the Crime Mapping Laboratory at:

pfmaplab@policefoundation.org
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Grants, Programs, & Activities: For a list of current funding opportunities complete with application kits and comprehensive descriptions on all our grant programs and more, including training and technical assistance, compliance and monitoring, and program assessment and policy support

Grantee Toolbox: Resources for our grantees including contact information, tips, grant owner's manuals, and progress report forms

Community Policing Resources: A repository of excellent community policing resources including COPS funded studies, reports, curriculums, tools, and tips, conference capsules, ongoing assessments, and promising practices from the field

Freedom of Information Act (FOIA): For FOIA contact information and an electronic reading room, including state listings of all COPS grantees

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Upcoming Conferences and Training

March

Geospatial Information & Technology Association (GITA) Annual Conference XXIV
March 4-7, 2001
San Diego, CA
www.gita.org

Introduction & Advanced Topics in GIS
March 5-7, 2001
Charlotte, NC
www.cicp.org or (877) 726-0555

Crime Mapping and Analysis Program (CMAP): MapInfo Class
March 19-23, 2001
Denver, CO
Contact: Alisa Anthony,
aanthony@du.edu or (800) 416-8086

Crime Mapping and Analysis Program (CMAP): ArcView Class
March 26-30, 2001
Whittier, CA
Contact: Alisa Anthony,
aanthony@du.edu or (800) 416-8086

April

International Association of Chiefs of Police (IACP): Introduction to Crime Analysis
April 23-25, 2001
Leavenworth, KS
Contact: Tresonya Ball, ballt@theiacp.org

Crime Mapping and Analysis Program (CMAP): ArcView Class
April 23-27, 2001
Whittier, CA
Contact: Alisa Anthony,
aanthony@du.edu or (800) 416-8086

General Web Resources for Training Seminars and Conferences

http://www.urisa.org/meetings.htm
http://www.ifp.uni-stuttgart.de/ifp/gis/conferences.html
http://www.geoinfosystems.com/calendar.htm
http://msdis.missouri.edu/
http://magicweb.kgs.ukans.edu/magic/magic_net.html
http://www.nsgic.org/
http://www.mapinfo.com/events
http://www.esri.com/events
http://www.ojp.usdoj.gov/cmrc/training/welcome.html
http://www.nlectc.org/nlectcrm/
http://www.nijpcs.org/upcoming.htm
http://www.usdoj.gov/cops/gpa/tta/default.htm
http://giscenter.isu.edu/training/training.htm
http://www.alphagroupcenter.com/index2.htm
http://www.cicp.org
http://www.actnowinc.org
http://www.ialeia.org/articles.html

Early Reminders!

Fourth Annual Massachusetts Association of Crime Analysts (MACA) Training Conference
May 15-18, 2001
North Falmouth, MA
Information available at:
www.macrimeanalysts.com

Twenty First Annual ESRI International User Conference
July 9-13, 2001
San Diego, CA
Information available at:
www.esri.com

Web Site Reviews

Computerized crime mapping is a discipline still very much in its preliminary stages within the law enforcement community. As reported in this issue, many obstacles prevent police agencies outside the English-speaking world from employing mapping as a regular component of their efforts to combat crime. An exhaustive search of the World Wide Web did not reveal any law enforcement agencies outside North America or the United Kingdom that regularly post crime maps to the Internet. However, a few police departments do mention the existence of crime mapping in their agencies, and two of these agencies are profiled below. If you know of a law enforcement agency located outside North America or the United Kingdom that employs computerized crime mapping and posts maps on the Internet, please forward that information to the Police Foundation's Crime Mapping Laboratory at pfmaplab@policefoundation.org. We will be sure to include this information in the next issue of *Crime Mapping News*.

New Zealand Police Force (NZPF) Web Site
http://www.police.govt.nz

The New Zealand Police Force's Web site contains an abundance of well-presented information detailing the various services provided by the department as well as safety tips and details about special operations that are pertinent to the community. Sections such as the *Crime Tip*, *Special Operations*, *Crime Solvers*, and the *Road Toll* on the home page demonstrate the NZPF's commitment to providing easily accessible information to the community. In a few clicks, users can have just about every general question regarding the department answered. Of particular interest are the links to the NZPF's special police units, where crime and intelligence analysis and crime mapping are discussed under the heading of the *Criminal Investigation Branch*. In reference to the technological resources at the disposal of the NZPF, the site indicates that "Crime mapping is a computer tool that presents police with information on where certain crimes are being committed." By merely discussing crime mapping, the NZPF Web site distinguishes itself from others throughout the world. It could be tremendously beneficial to the community, as well as to law enforcement professionals, if the agency posted crime maps on the Web site. This type of addition could enhance an already excellent international site.

New South Wales Police Service (NSWPS) Web Site
http://www.police.nsw.gov.au

The NZPF's trans-Tasman colleagues, the New South Wales Police Service, also boast a well-crafted Web site. In addition to providing information on all aspects of the Police Service, the NSWPS site has several other useful components. There is an online fee payment service, which undoubtedly simplifies procedures for police and civilians alike. Also, the NSWPS was charged with the daunting task of providing security at the recent Olympic Games in Sydney. The details of how the police managed such a challenge are available by linking to the department's *Olympic Security Command Centre* site. Reports such as the department's recent annual report and the five-year strategic plan have been rendered in .pdf format. The site also mentions the agency's crime mapping unit. Under the *Management Team* heading and the *Information and Intelligence Centre* subheading, the Mapping Unit is listed as one of nine sections of the Intelligence Service. The site lists the unit's duties as "providing hardcopy mapping," GIS system support, and mapping software training. As with the NZPF, there is no separate page for the Mapping Unit. Hopefully, the future holds a separate site for the Mapping Unit, as other police agencies and GIS professionals would likely take an interest in the crime mapping efforts of this police department.

We are interested in highlighting your Web site!

If your department or organization posts maps or has interactive maps on the Web, please let us know.
We will highlight your page in a future issue!
For contact information, see page 11.

ABOUT THE POLICE FOUNDATION

The Police Foundation is a private, independent, not-for-profit organization dedicated to supporting innovation and improvement in policing through its research, technical assistance, and communications programs. Established in 1970, the foundation has conducted seminal research in police behavior, policy, and procedure, and works to transfer to local agencies the best new information about practices for dealing effectively with a range of important police operational and administrative concerns. Motivating all of the foundation's efforts is the goal of efficient, humane policing that operates within the framework of democratic principles and the highest ideals of the nation.

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